

What is claimed is:

1. A front-end circuit for a communication terminal device with a multi-band and/or multi-mode transmission system, comprising:

at least one switch element selected from the group consisting of RF

5 switches, duplexers and diplexers;

a common antenna;

mixed mode filters for a mixed mode transmission system with a mixed  
FDD/TDD mode; and

pure mode filters for a pure mode transmission system with a pure FDD or  
pure TDD mode;

wherein individual filters of said mixed mode filters and said pure mode filters  
are connected to said common antenna via a circuit with said at least one switch  
element.

15 2. The circuit according to claim 1, further comprising:

a diplexer;

wherein a transmission band and a reception band of a transmission system  
form a band pair, a frequency difference between band pairs of a first and of a  
second transmission system amounts to approximately one octave, said diplexer  
20 being arranged between said common antenna and said filters for distinguishing  
between said band pairs.

3. The circuit according to claim 1, further comprising:

an RF switch;

25 wherein a transmission band and a reception band of a transmission system  
respectively form a band pair, frequencies of two band pairs of a first and of a  
second transmission system lying within approximately an octave, said RF switch  
being arranged between said common antenna and said filters for distinguishing  
between said band pairs.

4. The circuit according to claim 3, wherein said RF switch is a multiple switch, which additionally enables switching for a TDD mode.

5. The circuit according to claim 1, further comprising a low pass filter as a transmission filter.

6. The circuit according to claim 1, further comprising a duplexer for separating a transmission band and a reception band for said FDD mode in said pure FDD mode transmission system or in said mixed mode transmission system, said duplexer having a band pass filter or a steep-edge low pass filter as a filter for a transmission path.

7. The circuit according to claim 1, further comprising a common filter for two reception bands for said mixed mode transmission system, said common filter being part of a duplexer for separating a transmission band and a reception band of said pure FDD mode system; and a further filter for a transmission band of said pure FDD mode transmission system; and

20 an RF switch between said common antenna, said further filter and said duplexer.

8. The circuit according to claim 1, further comprising:

25 an RF switch between a common transmission path for said pure FDD mode transmission system and said pure TDD mode transmission system and two transmission filters; and

an RF multiple switch at said antenna for switching between a duplexer for said FDD mode, a transmission filter and a reception filter for said TDD mode;

frequency bands of said mixed mode transmission system being clearly spaced from one another.

10 9. The circuit according to claim 1, further comprising filters and signal paths  
for a further transmission system with pure FDD or pure TDD mode in addition to  
said transmission system with mixed FDD/TDD mode and said transmission system  
5 with pure FDD or TDD mode.

15 10. The circuit according to claim 9, further comprising:  
an RF switch at an antenna side of said circuit for a TDD system; and  
a duplexer for each FDD system.

20 11. The circuit according to claim 10, further comprising:

12 a diplexer; and

15 components for a further mixed transmission system in addition to said mixed  
and said two pure systems, at least one mixed transmission system being separated  
from other transmission systems at said antenna side by said diplexer.

20 12. The circuit according to claim 1, wherein said switches are fashioned as  
GaAs FET transistors.

25 13. The circuit according to claim 1, wherein said switches are realized with  
PIN diodes having additional phase shifters.

14. The circuit according to claim 1, wherein said switches are fashioned as  
a device selected from the group consisting of GaAs FET transistors and PIN diodes  
25 having additional phase shifters, said RF filters and duplexers being fashioned  
independently of one another as entities selected from the group consisting of SAW  
filters, MWK filters, FBAR filters, stripline filters, and chip LC filters or as  
combinations of said filters.

15. The circuit according to claim 1, wherein individual components of the circuit are arranged in a discrete manner on a common printed circuit board.

16. The circuit according to claim 1 wherein at least a part of discrete components of said circuit is integrated in a common substrate.

17. The circuit according to claim 16, wherein all individual components together with a DC drive are integrated in a common substrate that is realized in a multi-layer technique with partially planar structures.

18. The circuit according to claim 1, further comprising a directional coupler for regulating power of a power amplifier as part of a detector at least one transmission input.

19. The circuit according to claim 1, further comprising a protective element that protects a transmission amplifier against feedback or reflected power and is selected a group consisting of an insulator and a circulator, and is arranged between a transmission amplifier and a transmission filter.

20. A mobile radiotelephone device of the third generation, comprising:  
a front-end circuit for a communication terminal device with a multi-band and/or multi-mode transmission system, comprising:

at least one switch element selected from the group consisting of RF switches, duplexers and diplexers;

25 a common antenna;

mixed mode filters for a mixed mode transmission system with a mixed FDD/TDD mode; and

pure mode filters for a pure mode transmission system with a pure FDD or pure TDD mode;

wherein individual filters of said mixed mode filters and said pure mode filters are connected to said common antenna via a circuit with said at least one switch element, and said mobile radiotelephone device being operated in a system of the third generation.

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21. A mobile radiotelephone device, comprising:

a front-end circuit for a communication terminal device with a multi-band and/or multi-mode transmission system, comprising:

at least one switch element selected from the group consisting of RF switches, duplexers and diplexers;

a common antenna;

mixed mode filters for a mixed mode transmission system with a mixed FDD/TDD mode; and

pure mode filters for a pure mode transmission system with a pure FDD or pure TDD mode;

wherein individual filters of said mixed mode filters and said pure mode filters are connected to said common antenna via a circuit with said at least one switch element, and said mobile radiotelephone device being operated in a system of the second and the third generation.

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22. A front-end circuit for a communication terminal device with a multi-band and/or multi-mode transmission system, comprising:

at least one switch element selected from the group consisting of RF switches, duplexers and diplexers;

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a common antenna;

FDD pure mode filters for a pure mode transmission system with a pure FDD mode; and

TDD pure mode filters for a pure mode transmission system with a pure TDD mode;

5 wherein individual filters of said FDD pure mode filters and said TDD pure mode filters are connected to said common antenna via a circuit with said at least one switch element.

23. The circuit according to claim 22, further comprising an RF switch between a common transmission path for said pure FDD mode transmission system and said pure TDD mode transmission system and two transmission filters.

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